



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

REGION V
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

APR 24 1981

REPLY TO ATTENTION OF:
RFWHME

US EPA RECORDS CENTER REGION 5



506997

Thomas K. Berg, Esq.
United States Attorney
234 United States Courthouse
Minneapolis, Minnesota 55401

Re: United States v. Reilly Tar &
Chemical Corporation

Dear Tom:

Several issues need further clarification regarding the U.S. EPA paper entitled "A Review of Occurrences and Treatment of Polynuclear Aromatic Hydrocarbons" which was sent to you by Mr. Schwartzbauer on March 10, 1981.

1. On October 9, 1980, Dr. McMichael suggested that conventional treatment plus hydrogen peroxide (H_2O_2) treatment could be implemented at those St. Louis Park municipal wells with concentrations of polynuclear aromatic hydrocarbons (PAHs) greater than 200 ppt. In my comments to you on the October 9 meeting, I suggested that carbon adsorption is the treatment technology of choice and that Dr. McMichael failed to mention that H_2O_2 treatment requires a catalyst most often ultraviolet radiation. Carbon adsorption technology is preferred by this agency because there is ample information--case studies and literature--on the effectiveness of such a technology. Such a data base does not exist for H_2O_2 treatment technology. We are not, however, precluding the use of any other technology, including H_2O_2 , which is as effective as carbon adsorption. The attached diagram will hopefully crystallize for you the various treatment alternatives discussed to date. Conventional treatment does not include either H_2O_2 or carbon adsorption processes.

PAHs are removed by conventional treatment because conventional treatment removes particulate (suspended solids) in the water. The PAHs are adsorbed on the particulate in the raw water.

2. The majority of the case study data presented within the EPA report sent to you by Mr. Schwartzbauer is distinguishable from the fact situation in St. Louis Park. In the subject report, the treatment comparisons between raw and finished waters were often case studies where river water is the source of the water supply. In St. Louis Park, groundwater is used as the water source. Generally, river water has a greater suspended solids concentration than groundwater, e.g., 30 ppm (river) as compared to 1 ppm (groundwater). [These numbers are approximations.] Thus, conventional treatment will remove significant concentrations of PAHs from water, coincidentally, because conventional treatment removes particulate. But because the concentration of solids in the groundwater of St. Louis Park is negligible, the PAHs in the water are not adsorbed in particulate; but are dissolved in the water, or dissolved within an organic phase. If put into an equation, PAHs in the water supply could be represented by the following:

$$[\text{PAH}]_{\text{total}} = [\text{PAH}]_{\text{particulate (solid)}} + [\text{PAH}]_{\text{H}_2\text{O}_2 \text{ (liquid)}} + [\text{PAH}]_{\text{organic (liquid)}} + [\text{PAH}]_{\text{gas}}$$

[] = concentration

The referenced EPA paper is almost exclusively addressing the first term of this equation: [PAH] particulate, or removal of that amount of PAHs adsorbed on particulate within the water. However, in St. Louis Park, this term approaches zero and the latter three terms are controlling. I believe that Dr. McMichael is again misrepresenting the information presented within the referenced report; essentially, Dr. McMichael is attempting to mix apples and oranges.

Furthermore, the referenced report does not demonstrate sufficient removal efficiencies by conventional treatment methods, because conventional treatment is not designed for the purpose of PAH removal. Thus, conventional detectable concentrations to 2.8 ppt, the water quality criterion for PAHs. *missing sentence*

It is my hope that this letter will explain why conventional treatment (exclusively) is unacceptable for the Reilly case. If you should have any further questions, please do not hesitate to call me at (312) 886-6748.

Sincerely,

Melanie Toepfer

Melanie Toepfer
Engineering Section

Enclosure

